

The Present Invention

An object of the present invention is to provide a communication method and apparatus for a radio LAN system using macrodiversity, thus providing broad band transmission with relatively low transmission power, relatively low antenna gain and a relatively narrow transmission frequency band. This broadband transmission serves to eliminate the disadvantages of the prior art, namely excessive transmit power, increased antenna gain and inefficient use of available frequencies, which result from the prior art's attempt to prevent interruptions to the transmit signal between the transmit side and the receive side of a radio LAN system (specification, page 2, lines 9-37).

To achieve the above described objective, claim 1 recites time-divisionally distributing the first signal of said first transmission rate into $n-1$ second signals, converting said second signals into third signals of a second transmission rate less than said first transmission rate and transmitting said third signals through radio transmission paths between $n-1$ radio base stations and a terminal station. Thus, claim 1 is a method for bit rate conversion through a radio transmission path from radio base stations and a terminal station. According to this method, a fast transmission rate signal is converted to a lower transmission rate signal and the lower transmission rate signal is transmitted through radio transmission paths from a plurality of radio base stations to the terminal station. Therefore, under the same transmit power from the radio base stations, a ratio of a modulated signal to noise (C/N) of the lower transmission rate signal may be larger than that of the fast transmission rate signal. In other words, in order to obtain a desired C/N using the lower transmission rate signal, the transmission power of the radio base station may be reduced and

the antenna gain of the radio base station and the terminal station may also be reduced (specification, page 4, line 34 through page 5, line 14). This allows a relatively simple antenna to be used and, further, the power consumption of the radio LAN system may be reduced (specification, page 5, lines 14-16).

35 U.S.C. §103(a) Rejection over Sugihara in view of Tsinberg et al.

Claims 1, 2 and 5-7 are rejected under 35 U.S.C. §103(a) over Sugihara (U.S. Patent No. 5,757,785) in view of Tsinberg et al. (U.S. Patent No. 4,890,283). This rejection is respectfully traversed in light of the following.

The Examiner states that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the reduced equal bit rates in place of the different frequencies “to achieve faster and higher in transmission and reception of the radio systems, and to understand that there must be a base station which transmits signals to another terminal which receives signals in radio transmission.” Applicant respectfully disagrees with the Examiner’s assertion.

Sugihara

Sugihara is directed to providing a multi-directional multiple access communication system which can prevent mismatching in terms of the number of time slots. (Col. 2, lines 37-39). Thus, Sugihara discloses a system having rate conversion circuits 103f and 103g. Circuit 103f converts the signal rate from the transmission rate of the radio transmission path to that of the wire

transmission path. (Col. 4, lines 30-32). Circuit 103g converts the signal rate from the transmission rate of the wire transmission path to that of the radio transmission path. (Col. 4, lines 33-35). As the Examiner admits, Sugihara does not disclose that the second transmission rate is $1/(n-1)$ of the first transmission rate, transmitting $n-1$ signals at the second transmission rate through radio transmission paths between $n-1$ radio base stations and a terminal station connected to at least one terminal unit. Thus, Sugihara does not disclose an operation performed between the radio station and the radio subscriber stations, as in the present invention.

Tsinberg et al.

Tsinberg et al. teach a high definition television augmentation channel. More specifically, Tsinberg et al. disclose that digital data encoded from RGB high definition television signals are coupled to bit rate reducing circuitry wherein they are converted to digital signals at bit rates that are reduced from the bit rates of the input digital signals. (Col. 1, lines 50-55). Tsinberg et al. further disclose that the digital signals at the reduced bit rates are then coupled to a multiplexer, which sequentially positions the input data and provides a multiplicity of digital data streams having equal bit rates. (Col. 1, lines 55-58).

Present Invention Distinguished

In light of the foregoing with respect to Sugihara and Tsinberg et al., Applicant asserts that it would not have been obvious to one of ordinary skill in the art at the time of the invention to combine Tsinberg et al. with Sugihara as suggested by the Examiner.

First, Applicant asserts that there is no motivation to combine Tsinberg et al. with Sugihara. As stated above, Tsinberg et al. teach that the digital signals at the reduced bit rates are then coupled to a multiplexer which sequentially positions the input data and provides a multiplicity of digital data streams having equal bit rates. In contrast, Sugihara is not directed to making a multiplicity of digital data streams, but rather, Sugihara is directed to a bit rate conversion between the radio transmission path and the wire transmission path. Therefore, there would have been no motivation by one skilled in the art at the time of the invention to combine the teachings of these references.

Further, the claimed invention is not directed to “achieving faster and higher in [sic] transmission and reception of the radio systems,” as asserted by the Examiner. Rather, the present invention is directed to providing a broad band transmission system with relatively low transmit power, relatively low antenna gain and a relatively narrow transmission frequency band, as discussed above. Therefore, there would not have been any motivation to combine these the teachings of these references to achieve the objective of the present invention.

Claims 2 and 5-7 are allowable over the combination of Sugihara and Tsinberg et al. for the foregoing reasons with respect to claim 1. Accordingly, it is respectfully requested that this rejection be withdrawn.

35 U.S.C. §103(a): Sugihara, Tsinberg et al., Meier et al., Burger et al. and Takatori et al.

Claims 3-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sugihara and Tsinberg et al. as applied to claim 1 above, and further in view of Meier et al. (U.S. Patent No. 5,295,154), Burger et al. (U.S. Patent No. 4,777,634) and Takatori et al. (U.S. Patent No. 5,475,676). This rejection is respectfully traversed in light of the following.

In light of the foregoing arguments with respect to the Examiner's rejection over Sugihara and Tsinberg et al., the further addition of Meier et al., Burger et al. and Takatori et al. would not have rendered the present invention obvious to one of ordinary skill in the art. Accordingly, it is respectfully requested that this rejection be withdrawn.

This reasoning applies to the Examiner's rejections at items 5-8. Accordingly, it is respectfully requested that these rejections be withdrawn.

35 U.S.C. §103(a): Burger et al., Takatori et al. and Sabel

At page 5, item 9, claims 11 and 12 are rejected under 35 U.S.C. §103(a) over Burger et al. (U.S. Patent No. 4,777,634), Takatori et al. (U.S. Patent No. 5,475,676) as applied to claim 8 above, and further in view of Sabel (U.S. Patent No. 5,539,751). This rejection is respectfully traversed in light of the following.

The Examiner states that Burger et al. disclose, in the background of the invention, the summation of n-digital signals into a sum signal in the recovery of loss data. Further, the Examiner states that Takatori et al. disclose the protection line which will recover data when failure occurs in transmission. The Examiner then states that Sabel discloses that the change of

a signal “will be depended on the errors being detected out of synchronization state of transmission [sic].” Therefore, the Examiner states that it would have been obvious to understand that if there is an interruption in the transmission paths of radio systems with a backup system, the failed system will be detected out of the transmission path backup systems and the switching will control the protection units substituting for the failed system. The Applicant respectfully disagrees with the Examiner’s assertion.

First, the Examiner has not clearly indicated the element-by-element correspondence between the cited prior art and claims 11 and 12. For example, it is unclear from the Examiner’s rejection which elements of claims 11 and 12 Sabel discloses. Further the Examiner has asserted vague generalizations with regard to Burger et al. and Takatori et al. and failed to specify which elements claimed in claims 11 and 12 are shown in these references. The Examiner’s rejection appears to be incomplete and, accordingly, Applicant is unable to properly address this rejection. Accordingly, Applicant respectfully requests the Examiner to clarify this rejection or withdraw the same.

35 U.S.C. §103(a): Sugihara and Ikenoue

At page 6, item 10, claims 11 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sugihara and Ikenoue (U.S. Patent No. 5,220,566). The Examiner states that claims 11 and 12 are rejected “with the same reasons as set forth in claim 10.” However, again, the Examiner has failed to point out which elements are disclose or suggested by these references.

Accordingly, this rejection is incomplete and Applicant respectfully requests that the Examiner clarify this rejection or withdraw the same.

New Claim 13

Newly added claim 13 recites transmitting the n-1 third signals, which are at a rate less than the first transmission rate between n-1 radio base stations and a terminal unit. Accordingly, claim 13 is allowable for the foregoing reasons with respect to the allowability of claim 1.

Conclusion

In view of the above, it is respectfully submitted that the above-referenced application is in condition for allowance, which action is earnestly solicited.

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If any further fees are required in connection with the filing of this Amendment, please charge same to our Deposit Account No. 19-3935.



Respectfully submitted,

STAAS & HALSEY

By:

A handwritten signature in dark ink, appearing to read "Deborah S. Gladstein", written over a horizontal line.

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--ABSTRACT

@ A communication method for a radio LAN system provides communication at a first transmission rate. In the method, a first signal of the first transmission rate is time-divisionally distributed into $n-1$ second signals ($n=3, 4, \dots$). The $n-1$ second signals are respectively converted into $n-1$ third signals of a second transmission rate less than the first transmission rate. The $n-1$ third signals of the second transmission rate are also transmitted through radio transmission paths between $n-1$ radio base stations and a terminal station connected to at least one terminal unit.--
